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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,374	09/26/2003	Andy Aaron	N0484.70760US00	8515
23628 7590 02/22/2010 WOLF GREENFIELD & SACKS, P.C. 600 ATLANTIC AVENUE BOSTON, MA 02210-2206				
EXAMINER				
ARMSTRONG, ANGELA A				
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2626				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/672,374

**Applicant(s)**

AARON ET AL.

**Examiner**

ANGELA A. ARMSTRONG

**Art Unit**

2626

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 December 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,4,5,7-11,14,15,17-23 and 29-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4,5,7-11,14,15,17-23 and 29-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. This Office Action is in response to the amendment filed December 3, 2009, amending claims 1, 4, 7-11, 14, 17-23, and 29-35. Currently, claims 1, 4-5, 7-11, 14-15, 17-23, and 29-35 are pending.

#### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4, 7-8, 10-11, 14, 17-18, 20-23, and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lumelsky in view of Karaali (US Patent No. 5,668,926).
3. Lumelsky discloses a text-to-speech and prosody based authoring system, which includes a speech analyzer responsive to a spoken utterance. The speech analyzer generates a speech signal representative of one or more prosodic parameters associated with a speaker. A text-to-speech converter, responsive to a text signal generates a phonetic representation signal from the text signal and synthesizes a speech signal from the text signal.
4. Regarding claims 1, 4, 11, 14, 21, and 33-35, Lumelsky discloses a system and program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps for speech synthesis, the method steps comprising: determining prosodic parameters of a spoken utterance; automatically generating a formatted text

corresponding to the spoken utterance using the prosodic parameters; and generating a synthetic waveform using the formatted text (col. 8, line 52 continuing to col. 17, line 16). Lumelsky discloses the user specifies the pronunciation of the text string (col. 10, line 49 to col. 12, line 25-- the system synthesizes the voice, using one or more recorded allophone dictionaries which may be individually selected by the user. Because several dictionaries are available, the allophones recorded in the dictionaries define the preferred narrator voices, one of which may be chosen by the user, such that the user may preselect, the type of "voice" he wishes to have narrate the requested information and, depending on the selection, the appropriate allophone dictionary is used to speech synthesize the information. Additionally, Lumelsky indicates the system operates to generate prosody parameters, based on individual speech, and then use them during the speech synthesis at the user terminal. The prosody parameters are obtained by processing the speech signal submitted by the narrator). Lumelsky discloses the instructions for determining prosodic parameters comprise instructions for determining pitch contour, duration contour or energy contour information of the spoken utterance, or any combination thereof (col. 8, line 52 continuing to col. 17, line 16). Lumelsky does not teach, but Karaali teaches extracting duration parameters by aligning the audio signal with the text string (col.18, lines 24-42). It would have been obvious to one of ordinary skill at the time of the invention to modify the system of Lumelsky to implement determining duration parameters by aligning the audio with the text, as suggested by Karaali, for the purpose of obtaining the most optimum speech parameters to generate high quality synthetic speech.

Regarding claims 7 and 17, Lumelsky discloses instructions and methods for automatically generating a formatted text comprises instructions and methods for directly

specifying the prosodic parameters as attribute values for formatted elements (col. 8, line 52 continuing to col. 17, line 16).

Regarding claims 8 and 18, Lumelsky discloses instructions and methods for automatically generating a formatted text comprises instructions and methods for assigning abstract labels to the prosodic parameters to generate a high-level mark-up (col. 8, line 52 continuing to col. 17, line 16).

Regarding claims 10, 20 and 23, Lumelsky discloses processing phonetic content of the spoken utterance to generate the synthetic waveform having a desired pronunciation (col. 8, line 52 continuing to col. 17, line 16).

Regarding claim 22, Lumelsky discloses a user interface that enables a user to input the spoken utterance and input a text string corresponding to the spoken utterance (Figure 1, element 101).

Claims 5, 9, 15 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lumelsky in view of Karaali, as applied to claims 1 and 11 above, and further in view Applicant's Admitted Prior Art (AAPA).

Regarding claims 5 and 15, Karaali fails to teach the specifics of the alignment process includes implementation of a Viterbi alignment process. However, aligning a spoken utterance with a corresponding text string via a Viterbi alignment process was well known in the art. Applicant's admitted prior art (AAPA) specifically indicates implementation of Viterbi alignment was well known in the art. The specification at page 13, specifically discloses the invention can perform automatic alignment of the speech to the text using standard techniques in

speech analysis. Since Lumelsky and Karaali provides for the alignment of the speech and the corresponding text as input, one of ordinary skill in the art would have recognized that applying the known standard techniques of automatic Viterbi alignment of speech to text to the TTS system of would have yielded predictable results and resulted in an improved system.

Regarding claims 9 and 19, Lumelsky does not specifically teach the formatted text is generated using SSML (speech synthesis markup language). AAPA specifically indicates implementation of SSML for use on the Internet was known. It would have been obvious to one of ordinary skill at the time of the invention to implement SSML in the system of Lumelsky, for the purpose of providing high quality synthetic speech for use with Internet applications and resources.

Claims 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lumelsky in view of Karaali, as applied to claims 1 and 11 above, and further in view of Saon et al, "Maximum Likelihood Discriminant Feature Spaces," 2000, IEEE International Conference on Acoustics, Speech, and Signal Processing, Volume 2, 5-9 June 2000, pages 1129-1132.

5. Lumelsky discloses a text-to-speech and prosody based authoring system, which includes a speech analyzer responsive to a spoken utterance. The speech analyzer generates a speech signal representative of one or more prosodic parameters associated with a speaker. A text-to-speech converter, responsive to a text signal generates a phonetic representation signal from the text signal and synthesizes a speech signal from the text signal.
6. Regarding claims 29-32, the combination of Lumelsky and Karaali teach everything as claimed in claims 1 and 11. Lumelsky does not disclose all the details for extracting acoustic

information from the audio signal to include transforming the digitized input waveforms into a set of feature vectors on a frame-by-frame basis by producing a multi-dimensional cepstra feature vector for a predetermined intervals of the spoken audio signal, concatenating frames to the left and to the right of a current frame to augment a current cepstral vector, and reducing the dimension of each augmented cepstral vector using linear discriminant analysis. However, extracting cepstra features, splicing the frames and using linear discriminant analysis for dimensionality reduction was well known in speech and signal processing so as to obtain the best quality features generated with minimal loss in discrimination when the vectors dimensionality is reduced. Saon discloses a speech processing application which extracts acoustic information from voicemail messages which processes the audio signals to produce feature vectors of cepstral, delta and delta-delta coefficients from 9 consecutive frames, where the 9 consecutive 24-dimensional vectors were spliced together to form 216-dimensional feature vectors, which are subsequently reduced by applying the LDA. It would have been obvious to one of ordinary skill at the time of the invention to modify the system of Lumelsky to implement producing cepstra feature vectors, as was well known in the art, for the purpose of generating quality coefficients to be used in the system processing so as to ensure the best quality speech is synthesized.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1, 4-5, 7-11, 14-15, 17-23, and 29-35 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANGELA A. ARMSTRONG whose telephone number is (571)272-7598. The examiner can normally be reached on Monday-Thursday 11:30-8:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on 571-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Angela A Armstrong/  
Primary Examiner, Art Unit 2626